

U.S. Patent Application Serial No. 10/553,240
Response filed February 16, 2010
Reply to OA dated November 17, 2009

AMENDMENTS TO THE CLAIMS:

Please amend claim 9, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Withdrawn): A process for producing a fine silver particle colloidal dispersion of a water system, which comprises:

a reaction step of allowing an aqueous silver nitrate solution to react with a mixed solution of an aqueous iron(II) sulfate solution and an aqueous sodium citrate solution to form an agglomerate of fine silver particles;

a filtration step of filtering the resultant agglomerate of fine silver particles to obtain a cake of the agglomerate of fine silver particles;

a dispersion step of adding pure water to the cake to obtain a first fine silver particle colloidal dispersion of a water system in which dispersion the fine silver particles have been dispersed in the pure water; and

a concentration and washing step of concentrating and washing the first fine silver particle colloidal dispersion of a water system.

Claim 2 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 1, wherein the fine silver particle colloidal dispersion is controlled to have an

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electric conductivity of 200 $\mu\text{S}/\text{cm}$ or less at the solvent part exclusive of the fine silver particles from said fine silver particle colloidal dispersion of a water system.

Claim 3 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 1, wherein the fine silver particles in said fine silver particle colloidal dispersion of a water system have an average particle diameter of from 1 nm to 30 nm.

Claim 4 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 1, wherein the fine silver particles in said fine silver particle colloidal dispersion of a water system are in a concentration of from 10% by weight to 70% by weight.

Claim 5 (Withdrawn): A fine silver particle colloidal dispersion of a water system, which has been produced by the process according to claim 1, 2, 3 or 4.

Claim 6 (Withdrawn): A fine silver particle colloidal dispersion of a water system, which comprises having water as a solvent, containing fine silver particles dispersed in a concentration of from 10 to 70% by weight, containing no polymeric dispersing agent, and having an electric conductivity of 200 $\mu\text{S}/\text{cm}$ or less at the solvent part exclusive of the fine silver particles.

Claim 7 (Withdrawn): The fine silver particle colloidal dispersion according to claim 6, wherein said fine silver particles have an average particle diameter of from 1 nm to 30 nm.

Claim 8 (Withdrawn): A conductive silver film which comprises being formed by the use of the fine silver particle colloidal dispersion according to claim 5.

Claim 9 (Currently amended): A process for producing a fine silver particle colloidal dispersion of a water-organic solvent system which comprises:

a reaction step of allowing an aqueous silver nitrate solution to react with a mixed solution of an aqueous iron(II) sulfate solution and an aqueous sodium citrate solution to form an agglomerate of fine silver particles;

a filtration step of filtering the resultant agglomerate of fine silver particles to obtain a cake of the agglomerate of fine silver particles;

a dispersion step of adding pure water to the cake to obtain a first fine silver particle colloidal dispersion of a water system in which dispersion the fine silver particles have been dispersed in the pure water;

a concentration and washing step of concentrating and washing the first fine silver particle colloidal dispersion of a water system to obtain a second fine silver particle colloidal dispersion of a water system; and

a dilution and viscosity modifying step of adding an organic solvent to the second fine silver particle colloidal dispersion of a water system; wherein

in the concentration and washing step, the second fine silver particle colloidal dispersion of a water system is controlled such that the ~~to have an~~ electric conductivity of ~~200 μ S/cm or less at the~~ solvent part of the dispersion, exclusive of the fine silver particles, is 200 μ S/cm or less ~~from said second fine silver particle colloidal dispersion of a water system;~~

in the dilution and viscosity modifying step, said organic solvent comprises dimethyl sulfoxide, and the fine silver particles in said fine silver particle colloidal dispersion of a water-organic solvent system are in a concentration of from 10% by weight to 70% by weight; and

said fine silver particle colloidal dispersion of a water-organic solvent system does not contain any polymeric dispersing agent.

Claim 10 (Previously Presented): The process for producing a fine silver particle colloidal dispersion according to claim 9, wherein the dimethyl sulfoxide is mixed in an amount of from 2 parts by weight to 50 parts by weight based on 100 parts by weight of the fine silver particles.

Claim 11 (Canceled)

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Claim 12 (Original): The process for producing a fine silver particle colloidal dispersion according to claim 9, wherein the fine silver particles in said fine silver particle colloidal dispersion of a water-organic system have an average particle diameter of from 1 nm to 30 nm.

Claim 13 (Canceled)

Claim 14 (Withdrawn): A fine silver particle colloidal dispersion of a water-organic solvent system, which has been produced by the process according to claim 9, 10, 11, 12, or 13.

Claim 15 (Withdrawn): A fine silver particle colloidal dispersion of a water-organic solvent system, which comprises having water and an organic solvent as solvents, containing fine silver particles dispersed in a concentration of from 10 to 70% by weight, containing no polymeric dispersing agent, and having viscosity having been controlled within the range of from 1 to 1,000,000 mPa·s.

Claim 16 (Withdrawn): The fine silver particle colloidal dispersion according to claim 15, wherein said organic solvent comprises dimethyl sulfoxide.

Claim 17 (Withdrawn): The fine silver particle colloidal dispersion according to claim 15, wherein said fine silver particles have an average particle diameter of from 1 nm to 30 nm.

Claim 18 (Withdrawn): A conductive silver film which comprises being formed by the use of the fine silver particle colloidal dispersion according to claim 14.

Claim 19 (Withdrawn): A process for producing a fine silver particle colloidal dispersion of an organic solvent system, which comprises:

a reaction step of allowing an aqueous silver nitrate solution to react with a mixed solution of an aqueous iron(II) sulfate solution and an aqueous sodium citrate solution to form an agglomerate of fine silver particles;

a filtration step of filtering the resultant agglomerate of fine silver particles to obtain a cake of the agglomerate of fine silver particles;

a dispersion step of adding pure water to the cake to obtain a first fine silver particle colloidal dispersion of a water system in which dispersion the fine silver particles have been dispersed in the pure water;

a concentration and washing step of concentrating and washing the first fine silver particle colloidal dispersion of a water system to obtain a second fine silver particle colloidal dispersion of a water system; and

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a solvent displacement step of adding an organic solvent to the second fine silver particle colloidal dispersion of a water system and thereafter removing the water.

Claim 20 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 19, wherein said organic solvent comprises dimethyl sulfoxide.

Claim 21 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 19, wherein the fine silver particle colloidal dispersion is controlled to have an electric conductivity of 200 $\mu\text{S}/\text{cm}$ or less at the solvent part exclusive of the fine silver particles from said second fine silver particle colloidal dispersion of a water system.

Claim 22 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 19, wherein the fine silver particles in said fine silver particle colloidal dispersion of an organic solvent system have an average particle diameter of from 1 nm to 30 nm.

Claim 23 (Withdrawn): The process for producing a fine silver particle colloidal dispersion according to claim 19, wherein the fine silver particles in said fine silver particle colloidal dispersion of an organic solvent system are in a concentration of from 10% by weight to 70% by weight.

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Claim 24 (Withdrawn): A fine silver particle colloidal dispersion of an organic solvent system, which has been produced by the process according to claim 19, 20, 21, 22 or 23.

Claim 25 (Withdrawn): A fine silver particle colloidal dispersion of an organic solvent system, which comprises having an organic solvent, containing fine silver particles dispersed therein in a concentration of from 10 to 70% by weight, containing no polymeric dispersing agent, and having viscosity having been controlled within the range of from 1 to 1,000,000 mPa·s.

Claim 26 (Withdrawn): The fine silver particle colloidal dispersion according to claim 25, wherein said organic solvent comprises dimethyl sulfoxide.

Claim 27 (Withdrawn): The fine silver particle colloidal dispersion according to claim 25, wherein said fine silver particles have an average particle diameter of from 1 nm to 30 nm.

Claim 28 (Withdrawn): A conductive silver film which comprises being formed by the use of the fine silver particle colloidal dispersion according to claim 24.

Claim 29 (Withdrawn): A conductive silver film which comprises being formed by the use of the fine silver particle colloidal dispersion according to claim 6 or 7.

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Claim 30 (Withdrawn): A conductive silver film which comprises being formed by the use of the fine silver particle colloidal dispersion according to claim 15, 16 or 17.

Claim 31 (Withdrawn): A conductive silver film which comprises being formed by the use of the fine silver particle colloidal dispersion according to claim 25, 26 or 27.